

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended) A photosemiconductor device comprising:

a light oscillation part formed in a first region of a first conduction-type semiconductor substrate and including a first active layer which generates light by current injection, a wavelength tuning layer with a second conduction-type intermediate layer formed between the first active layer and the wavelength tuning layer, for varying an oscillation wavelength by current injection, and a diffraction grating formed near the first active layer and the wavelength tuning layer; and

a light amplification part formed in a second region of the semiconductor substrate and including a second active layer which amplifies light by current injection, for amplifying light generated by the light oscillation part,

the light amplification part being processed in a mesa stripe, and

the device further comprising one electrode for leading out current from the light amplification part, said one electrode being positioned at the side surface of the mesa stripe.

Claim 2 (original) The photosemiconductor device according to claim 1, wherein

a clad layer of the second conduction-type is formed between the semiconductor substrate

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and the second active layer.

Claim 3 (original) The photosemiconductor device according to claim 2, wherein
two semiconductor layers of conduction types different from each other are formed between
the semiconductor substrate and the clad layer.

Claim 4 (original) The photosemiconductor device according to claim 2, wherein
a semi-insulating semiconductor layer is formed between the semiconductor substrate and
the clad layer.

Claim 5 (previously presented) The photosemiconductor device according to claim 2,
further comprising:

another electrode for injecting current into the light amplification part,
said one electrode and said another electrode being formed on the side of a first surface of
the semiconductor substrate.

Claim 6 (previously presented) The photosemiconductor device according to claim 5,
wherein

said one electrode is formed on a semiconductor layer of the second conduction-type
connected to the clad layer at the side surface of the mesa stripe.

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Claim 7 (original) The photosemiconductor device according to claim 1, wherein
a clad layer of the second conduction-type is formed on the second active layer.

Claim 8 (original) The photosemiconductor device according to claim 7, wherein
the intermediate layer is formed, extended in the second region of the semiconductor
substrate.

Claim 9 (previously presented) The photosemiconductor device according to claim 7,
further comprising:

another electrode for injecting current into the light amplification part, said another electrode
being formed on the side of a second surface of the semiconductor substrate,
said one electrode being formed on the side of a first surface of the semiconductor substrate.

Claim 10 (previously presented) The photosemiconductor device according to claim 9,
wherein

said one electrode is formed on a semiconductor layer of the second conduction-type
connected to the clad layer at the side surface of the mesa stripe.

Claim 11 (original) The photosemiconductor device according to claim 1, further
comprising

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an optical waveguide part which is formed between the light oscillation part and the light amplification part and does not contribute to the light oscillation and the light amplification.

Claim 12 (original) The photosemiconductor device according to claim 1, wherein the first active layer and the second active layer are formed of a semiconductor layer of the same structure.

Claim 13 (original) The photosemiconductor device according to claim 1, wherein the light oscillation part has a mesa stripe configuration of a first width, the light amplification part has a mesa stripe configuration of a second width, and the first width is continuously changed to the second width between the light oscillation part and the light amplification.

Claim 14 (original) The photosemiconductor device according to claim 1, further comprising an anti-reflection film formed on the end surface of the light amplification part.

Claim 15 (currently amended) The ~~photosemiconductor~~ photosemiconductor device according to claim 1, wherein the light oscillation part comprises a plurality of light oscillation elements having central

oscillation wavelengths different from each other,

the device further comprising:

a plurality of optical waveguides formed between the light oscillation part and the light amplification part, for guiding light output from the plurality of the light oscillation elements; and

an optical coupler part for connecting the plurality of the optical waveguides and the light amplification part.

Claim 16 (currently amended) A photosemiconductor device comprising:

a light oscillation part formed in a first region of a first conduction-type semiconductor substrate and including an active layer, for generating light by current injection, and a wavelength ~~control~~ tuning layer with a second-conduction type intermediate layer formed between the active layer and the wavelength ~~control~~ tuning layer, for varying an oscillation wavelength of the active layer by current injection; and

an optical waveguide part including an insulation ~~layer~~ film formed in a second region of the semiconductor substrate and an optical waveguide layer formed above the insulation film, for guiding light output from the light oscillation part.

Claim 17 (original) The photosemiconductor device according to claim 16, wherein

the insulation film includes two semiconductor layers of conduction types different from each other.

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Claim 18 (currently amended) The photosemiconductor device according to claim 16, wherein

the insulation ~~layer~~ film comprises a semi-insulating semiconductor layer.

Claim 19 (currently amended) The photosemiconductor device according to claim 16, further comprising

a buried layer formed on the semiconductor substrate, for covering the side of a first mesa stripe of the active layer, the intermediate layer and the wavelength ~~control~~ tuning layer which are patterned and for covering the side of a second mesa stripe of the insulation ~~layer~~ film and the optical waveguide layer which are patterned.

Claim 20 (original) The photosemiconductor device according to claim 19, wherein

the buried layer includes a first buried layer of the second conduction type electrically connected to the intermediate layer and a second buried layer formed between the semiconductor substrate and the first buried layer, for insulating the first buried layer from the semiconductor substrate.

Claim 21 (original) The photosemiconductor device according to claim 20, wherein

the second buried layer includes two semiconductor layers of conduction types different from each other.

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Claim 22 (original) The photosemiconductor device according to claim 19, wherein the first mesa stripe and the second mesa stripe are connected continuously to each other.

Claim 23 (original) The photosemiconductor device according to claim 16, further comprising

a light amplification part formed in a third region of the semiconductor substrate, for amplifying light which has been generated in the light oscillation part and has propagated through the optical waveguide part.

Claim 24 (original) The photosemiconductor device according to claim 23, wherein the light oscillation part includes a plurality of light oscillation elements having central oscillation wavelengths different from one another, and

the optical waveguide part includes a plurality of optical waveguides for guiding light output from the plurality of the light oscillation elements and an optical coupler part for connecting the plurality of the optical waveguides and the light amplification part.

Claim 25 (original) The photosemiconductor device according to claim 16, wherein the first conduction type is p type, and the second conduction type is n type.

Claims 26-30 (canceled).

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Claim 31 (currently amended) A ~~photosemiconductor~~ photosemiconductor device comprising:

a light oscillation part formed on a first conduction-type semiconductor substrate and including a plurality of light oscillation elements which include an active layer for generating light by current injection, a wavelength tuning layer with a second conduction-type intermediate layer formed between the active layer and the wavelength tuning layer, for varying an oscillation wavelength by current injection, and a diffraction grating formed near the active layer and the wavelength tuning layer; and

a current leading-out part for selectively leading out current injected into the active layer or the wavelength tuning layer from the intermediate layer of an arbitrary one of the light oscillation elements.

Claim 32 (original) The photosemiconductor device according to claim 31, wherein the current leading-out part includes a plurality of switches for changing over the respective connections of the intermediate layer of the plurality of the light oscillation elements to a reference potential.

Claim 33 (currently amended) The photosemiconductor device according to claim 31, further comprising

a first current injecting part for injecting current into the active layer or the wavelength tuning

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layer of the plurality of the light oscillation elements via an electrode formed on the side of a first surface of the semiconductor substrate.

Claim 34 (currently amended) The photosemiconductor device according to claim 33, wherein

the first current injecting part includes an electric power source, and a plurality of wires connecting the active layer or the wavelength tuning layer of the plurality of the light oscillation elements in parallel to the electric power source.

Claim 35 (original) The photosemiconductor device according to claim 34, wherein the first current injecting part further includes a plurality of switches respectively provided in the plurality of the wires.

Claim 36 (currently amended) The photosemiconductor device according to claim 32, further comprising

a first current injecting part comprising an electric power source, a plurality of wires connecting the active layer or the wavelength tuning layer of the plurality of the light oscillation elements in parallel to the electric power source, and a plurality of switches provided in the respective plurality of the wires and interlocked operatively with the plurality of the switches of the current leading-out part, for injecting current into the active layer or the wavelength tuning layer of

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an arbitrary one of the light oscillation elements via an electrode formed on the side of a first surface of the semiconductor substrate.

Claim 37 (currently amended) The photosemiconductor device according to claim 31, further comprising

a second current injecting part for injecting current into the wavelength tuning layer or the active layer of the plurality of the light oscillation elements via an electrode formed on the side of a second surface of the semiconductor substrate.

Claim 38 (currently amended) The ~~photosemiconductor~~ photosemiconductor device according to claim 31, further comprising

a light amplification part formed on the semiconductor substrate and including an active layer for amplifying light by current injection, for amplifying light generated by the light oscillation part.

Claim 39 (currently amended) The photosemiconductor device according to claim 38, between the light oscillation part and the light amplification part, further comprising:

a plurality of optical waveguides for guiding light output from the plurality of the light oscillation elements; and

an optical coupler for optically connecting the plurality of the optical ~~wavguides~~ waveguides and the light amplification part.

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Claim 40 (original) The photosemiconductor device according to claim 31, wherein
the plurality of the light oscillation elements have central oscillation wavelengths different
from one another.

Claims 41-48 (canceled).